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October 29, 2019

VIA ECFS

Marlene H. Dortch, Secretary
Federal Communications Commission
445 12th Street SW
Washington, DC 20554

Re: TerreStar Corporation Request for Temporary Waiver of Substantial Service Requirements for 1.4 GHz Licenses, WT Docket No. 16-290

Dear Ms. Dortch,

As the Commission seeks a path forward with regard to WMTS offerings in the 1.4 GHz band, it must keep in mind four undisputed facts:

- Almost immediately after acquiring spectrum licenses in the 1.4 GHz band, TerreStar set to work on developing, constructing, and deploying a smart grid network that was fully compliant with the agency's interference regime and other rules.
- There was no reasonable regulatory expectation that TerreStar could have identified interference with WMTS services in adjacent spectrum bands on its own.
- TerreStar, in any event, bore no obligation to hunt for such interference.
- Upon the discovery of WMTS interference problems, TerreStar worked diligently with the Commission and the WMTS community to find a solution.

In short, TerreStar has acted in good faith. Having done so, and having ceded its original hope of deploying a smart grid network, TerreStar seeks only the opportunity to provide an offering consistent with the needs of WMTS providers. The Commission should grant TerreStar's waiver request and allow the company to put its spectrum to use for American consumers.

TerreStar Worked Diligently to Deploy a Smart Grid Network in the 1.4 GHz Band

TerreStar acquired the first of its 1.4 GHz licenses in 2007, and the remainder – most of its total of sixty-four 1.4 GHz licenses – in 2008. It quickly began working closely with

standards-setting bodies, utilities, and device and component manufacturers to set standards that would promote a flourishing ecosystem for its 1.4 GHz smart grid network. By November 2008, TerreStar had inked an agreement with Airspan to develop smart grid equipment, including base stations, subscriber units, and a terminal module, as well as networks for the 1.4 GHz band.[1] Two months later, recognizing the particular needs of a network used to operate critical energy infrastructure, TerreStar began working with partners to developing an enhanced, high security, high reliability air interface standard, WiGRID, for use with its 1.4 GHz smart grid networks. The next month, February 2009, TerreStar entered into a spectrum lease arrangement with Pepco contemplating early deployments of 1.4 GHz smart grid networks. Spectrum lease agreements with the Rural Broadband Corporation, One Dot Four Corp., and electric utility FirstEnergy Service Company ("FirstEnergy") followed. During 2009, the Commission certified TerreStar's subscriber unit and base station for smart grid use. TerreStar's work on the smart grid project continued from there. By 2013, TerreStar had certified several classes of devices and was on its way to completing a full ecosystem built and certified in partnership with others, including Airspan and Cisco. TerreStar was on track to satisfy its substantial service requirements, with robust demand for the smart grid service and a market expected to surpass $20 billion by 2017.[2]

This background decisively refutes any claim that TerreStar was not serious about deploying a smart grid network in the 1.4 GHz band, or that it did not work diligently to bring its plan to fruition. Beginning within months of acquiring the necessary licenses, TerreStar made every reasonable effort possible to develop and deploy this network – until it became aware of interference concerns in late 2013. Furthermore, the FCC's rules do not require licensees to meet benchmarks along the way or early in their license terms. As TerreStar has previously explained, and as undisputed in the record, if it had pursued its smart grid plan, it likely would have met its buildout requirements by its initial deadline.

TerreStar Could Not Have Identified WMTS Interference Concerns on Its Own

It was not until December 2013 – when TerreStar was in the advanced stages of deploying its smart grid application – that TerreStar was encouraged to discuss its plans with adjacent spectrum holders. TerreStar had a meeting with FCC staff to discuss its plan for

[1] *See* Petition for Reconsideration of TerreStar Corporation, WT Docket No. 16-290, at 6 (filed Nov. 9, 2017) ("Petition"); TerreStar Corporation Request for Temporary Waiver of Substantial Service Requirements, FCC ULS File Nos. 0007375830-0007375893, at 7 (filed Aug. 12, 2016) ("Waiver"); TerreStar Timeline *attached to* Ex Parte Letter of TerreStar, WT Docket No. 16-290 (filed May 4, 2018) (extensively detailing the steps taken in pursuit of a smart grid solution from 2008 until 2013) ("TerreStar Timeline").

[2] Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 1-2 (filed May 4, 2018); Research & Markets, Growth Opportunities in US Smart Grid Market 2012–2017: Trends, Forecast, and Market Share Analysis (June 2012), https://www.researchandmarkets.com/research/n7gfc5/growth; *see also* U.S. Dep't of Energy, 2014 Smart Grid Report, at 10-11 (Aug. 2014), https://www.smartgrid.gov/files/2014-Smart-Grid-System-Report.pdf.

operations of a 5 MHz channel across the unpaired (1390-1392 MHz) and Lower A+B (1392-1393.5 MHz + 1393.5-1395 MHz) blocks as well as possible changes to its operations and other business ventures in the 1695-1710 MHz spectrum.[3] FCC staff informed the company that, although it complied with all relevant interference requirements, its operations might interfere with next-generation WMTS devices in adjacent spectrum bands. During the conversations that followed, TerreStar learned from the wireless medical telemetry community that TerreStar's smart grid service, notwithstanding its compliance with out-of-band emission ("OOBE") rules and all other technical requirements, was incompatible with life-critical WMTS devices in the 1.4 GHz band. As TerreStar has previously explained, this interference arose from the fact that the receiver passband filter of the adjacent band service was too wide. Put differently, the WMTS devices had been designed to "listen" across TerreStar's 1.4 GHz spectrum holdings. Importantly, the sensitivity of these receivers, built and deployed during or after 2011, was not known, and could not have been predicted in 2002, when the FCC first wrote the service rules for the 1.4 GHz band, or in 2007-2008, when TerreStar acquired its 1.4 GHz spectrum. WMTS device manufacturers did not notify TerreStar or anyone else of their product's specifications, and were under no obligation to do so. Indeed, the sensitivity of WMTS receivers was not made public even after the FCC certified WMTS transmitters in 2011.[4] For these reasons, no amount of due diligence of publicly available information by TerreStar could have uncovered the WMTS interference issues as it was working to deploy smart grid technology.

TerreStar Bore No Obligation to Discover the Interference on Its Own

Even if TerreStar could have uncovered the WMTS interference issues as it was working to deploy its smart grid technology, it had no obligation to do so. Its smart grid network and equipment were fully compliant with all technical rules, including the Commission's general OOBE limits as well as the OOBE field-strength limits that apply specifically to TerreStar's 1.4 GHz spectrum.[5] When a licensee is fully compliant with the governing interference standards, neither the Communications Act nor the Commission's rules impose on that licensee an obligation to search out interference in adjacent bands. For example, Section 333 – the provision that most directly addresses interference – cannot reasonably be understood to oblige every authorized user of spectrum to proactively seek out authorized neighbors (or other spectrum users in vulnerable harmonics) to determine whether there is potential for future interference – that approach would write the words "willful" and "malicious" out of the statute altogether.[6]

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[3] During this meeting, FCC staff informed TerreStar that it could operate in this 5 MHz channel without a waiver because TerreStar was the sole, nationwide licensee in the commercial wireless 1.4 GHz band.

[4] Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 6 (filed Jan. 29, 2018) ("Legal Analysis").

[5] Petition at 2, 8, 15-16; Supplemental Comments of TerreStar Corporation, WT Docket No. 16-290, at 16-17 (filed June 7, 2017) ("Supplemental Comments").

[6] Section 333, which prohibits *willful* and *malicious* interference, was intended to apply to a set of facts much different than those here. Section 333's legislative history defines willful and malicious interference to include "intentional jamming, deliberate transmission on top of the transmissions of

Nor can other statutory provisions or Commission rules be interpreted to require such actions. The entire point of the Commission's OOBE rules is to establish the circumstances under which licensees authorized to operate in adjacent spectrum can be reasonably confident that there will be no interference from nearby operations. If both spectrum users are operating systems that are fully compliant with FCC rules – as was the case here – that is a completely reasonable expectation. The regime would be rendered meaningless and the obligations potentially infinite if every licensee were expected to hunt down potential out-of-band interference even when it and the adjacent operator both complied with Commission limits. To be sure, compliance with OOBE limits does not absolutely preclude actual interference, as this matter and several other recent proceedings have made clear. But if interference does occur, the Commission should not arbitrarily fault one operator for failing to anticipate a problem in a neighboring system that was also fully compliant with FCC rules.[7]

Upon Discovering the WMTS Interference, TerreStar Worked with Others to Find a Solution, Drastically Altering Its Own Plans for the 1.4 GHz Band

As soon as TerreStar discovered the potential for interference with WMTS, it began working toward a solution that would have maintained its smart grid business. It aggressively explored numerous options – exclusion zones, receiver filtration, and band plan modifications – but none of these could guarantee WMTS protection against interference.[8] Even minimal exclusion zones of 1 kilometer around approximately 3,800 registered WMTS facilities would cripple the commercial smart grid service across most of the populated land mass. Exclusion zones were also not able to guarantee the elimination of mobile terminal emissions within or near a medical facility. Filters would not protect against out of band emissions, especially from mobile devices, and passband attenuation would degrade the sensitivity of WMTS receivers rendering them unworkable. Band reformation, which was TerreStar's final attempt to save its smart grid service, would not work because any potential solutions where fixed base stations would be safer for WMTS were based on hypotheticals where existing neighboring systems would be replaced and a future rulemaking would allocate TerreStar commercial spectrum below

authorized users already using specific frequencies in order to obstruct their communications, repeated interruptions, and the use and transmission of whistles, tapes, records, or other types of noisemaking devices to interfere with the communications or radio signals of other stations." *See* H.R. Rep. No. 101-316, at 8 (1989).

[7] *See* Legal Analysis at 6-7.

[8] *See* TerreStar, TerreStar and Medical Telemetry (June 2017), *attached to* Ex Parte Letter of TerreStar, WT Docket No. 16-290 (filed June 14, 2017); *see also* Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 2 (filed Aug. 26, 2019).

1390 MHz and turn 1432-1435 MHz into standard WMTS.[9] None of these actions ultimately occurred.

By the middle of 2015, extensive testing demonstrated that smart grid or any other broadly deployed commercial network would cause significant WMTS system failure.[10] In response to this, TerreStar made the difficult decision to abandon all conventional smart grid operations, determining that commercial wireless medical telemetry was the only realistic commercially viable possibility that would not result in serious harm to WMTS systems.[11] This decision resulted in substantial stranded investments – TerreStar had spent a great deal of time and money preparing its smart grid business. TerreStar recognized, however, that continued pursuit of the smart grid network could jeopardize life-critical patient monitoring networks at thousands of registered health care facilities across the country. Thus, by late 2015, TerreStar was actively preparing for WMTS deployment. It met and worked cooperatively with WMTS vendors and ASHE, and moved forward with initial application development and medical device testing.[12] From late 2015 to mid-2016, TerreStar worked closely with WMTS industry representatives to develop a new commercial WMTS proposal.

Unsurprisingly, the abrupt about-face forced upon TerreStar disrupted its plans, and particularly its ability to meet build-out requirements that would not have been problematic had it been able to stick with its initial smart grid business. As detailed below, the Commission should not penalize TerreStar for its good faith efforts to accommodate unexpected interference. Rather, it should grant TerreStar's waiver, giving the company additional time and ensuring the prompt deployment of medical telemetry offerings that will advance the public interest.

Grant of the Waiver Request and Reconsideration Petition Will Best Serve the Public Interest

As detailed in prior filings, grant of both TerreStar's waiver request and its reconsideration petition is warranted under Section 1.925 of the Commission's rules.[13] A grant

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[9] TerreStar met with industry and FCC officials to explore these options, but it became clear they were not viable.

[10] *See* TerreStar, Summary of Medical Telemetry Interference and Failure Analysis, *attached to* Ex Parte Letter of TerreStar, WT Docket No. 16-290 (filed July 17, 2018).

[11] Supplemental Comments at 19; *see also* Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 3 (filed May 4, 2018) (stating "[b]eginning in December 2015, TerreStar, FCC staff, and WMTS providers held numerous meetings and calls to resolve what all recognized to be a problem, and devised what all appeared to appreciate as a creative and elegant solution").

[12] Supplemental Comments at 20.

[13] *See* Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 2-3 (filed Aug. 26, 2019); Petition at 16-18; Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 2-3 (filed May 1, 2019); *see also* Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 1-2, 4 (filed June 12, 2017).

would not only further the purpose of the agency's buildout rules, but also result in faster deployment of the commercial 1.4 GHz spectrum, provide Channel 37 WMTS users an additional option for capacity, ameliorate congestion in the 1.4 GHz WMTS spectrum, and enable greater future use of the neighboring 1300-1390 MHz spectrum.[14] TerreStar has committed to deploy to at least 50 large healthcare facilities within 18 months of grant of its Petition for Reconsideration. It has further committed to deploy service to *all registered large healthcare facilities across the country* within 36 months of a grant.[15] TerreStar will make its licensed spectrum available to multiple vendors or manufacturers at reasonable costs via non-exclusive spectrum manager leasing arrangements, allowing for coverage of the entire populated geography of the United States and extending the useful life of installed wireless medical telemetry equipment.[16]

It is also critical to the public interest that the Commission grant TerreStar's requested relief soon. If the waiver had been granted back in 2017, TerreStar would be rolling out services today, with full-scale deployment at 2,000 hospitals and health care facilities by April 2020.[17] If the waiver were granted today, TerreStar could begin to deploy immediately, bringing additional WMTS spectrum to the marketplace sooner than anyone else. A grant therefore would be aligned with the Commission's spectrum policy to "ensur[e] efficient use of the spectrum, and expeditious service to the public."[18]

Quickly granting TerreStar's requested relief would also greatly benefits Veterans Affairs ("VA") Medical Centers. While all hospitals must confront the limitations of wireless medical telemetry, looming capacity shortfalls are especially challenging for VA Medical Centers due to critical cybersecurity mandates, which require WMTS networks to meet the FIPS 140-2 standard through integration of strong encryption. Such encryption consumes approximately 50 percent of the existing medical telemetry network capacity. Additional commercial spectrum for WMTS

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[14] *See, e.g.*, Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 2-3 (filed Aug. 26, 2019).

[15] *See* TerreStar, Promoting Rapid Deployment of Enhanced Wireless Medical Telemetry, at 7 (Mar. 14, 2019) *attached to* Ex Parte Letter of TerreStar, WT Docket No. 16-290 (filed Mar. 15, 2019); Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 3 (filed May 1, 2019); Ex Parte Letter of TerreStar, WT Docket No. 16-290, at 2 (filed May 22, 2019).

[16] *See, e.g.*, Supplemental Comments at 9-11.

[17] *See* Petition at 3, 11 & n. 47 (explaining that the milestones previously discussed with the Commission included "trial deployment of wireless medical telemetry in TerreStar's spectrum at 50 health care facilities by March 2019" and "and full-scale deployment of wireless medical telemetry in TerreStar's spectrum at 2,000 health care facilities by April 2020").

[18] *See* Petition at 6 (quoting *Amendments to Parts 1, 2, 27 and 90 of the Commission's Rules to License Services in the 216- 220 MHz, 1390-1395 MHz, 1427-1429 MHz, 1429-1432 MHz, 1432-1435 MHz, 1670-1675 MHz, and 2385-2390 MHz Government Transfer Bands*, Report and Order, 17 FCC Rcd 9980, 10011 ¶ 73 (2002)).

would prevent the VA from having to reduce the number of patients they can monitor or the quality of such monitoring.

Denial of TerreStar's requests, conversely, would badly disserve the public interest. In the wake of a denial, the Commission would face multiple challenges. First, it would need to revise the technical service rules for the 1.4 GHz band to account for the WMTS interference and determine a new licensing regime.[19] These potential licensees would then need to develop entirely new ecosystems to address continued interference concerns. Together, these complications would mean delays in the constructive use of this spectrum and lingering uncertainty for the WMTS community, hospitals, and patients.

For the reasons described above, the Commission should promptly grant TerreStar's requests for waiver and reconsideration, allowing the company to supplement WMTS offerings with expanded medical telemetry services in the 1.4 GHz band.

Sincerely,

/s/
Bryan N. Tramont

[19] *See* Petition at 5.